



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,438	11/20/2003	Wolfgang Rein	9101.00005	9834

10534 7590 02/01/2005
BLISS MCGLYNN, P.C.
2075 WEST BIG BEAVER ROAD
SUITE 600
TROY, MI 48084

EXAMINER

MCMAHON, MARGUERITE J

ART UNIT PAPER NUMBER

3747

DATE MAILED: 02/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/718,438

Applicant(s)

REIN ET AL.

Examiner

Marguerite J. McMahon

Art Unit

3747

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4-8, 11-13, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loughlin (5,661,904) in view of Hart et al (6,557,457). Loughlin shows everything except the end of the connecting rod aligned with the piston bore including a phosphatized coating that is adapted to facilitate relative angular movement between the bore extending through the connecting rod and the outer circumference of the piston pin. Hart et al teach that it is old in the art to provide a phosphatized coating on at least one of the running surfaces of the wrist pin and connecting rod bore (see abstract and column 2, lines 47-60). It would have been obvious to one having ordinary skill in the art to modify Loughlin by providing a phosphatized coating on the inside surface of the connecting rod bore and/or the outside surface of the piston pin in lieu of a conventional bushing usually pressed into the connecting rod bore, **in order provide the necessary tribological properties therebetween, more simply and inexpensively.** In addition, Hart et al show a slightly different range of thickness of phosphate coating than applicant's, i.e. applicant claims a range of 2 to 8 micrometers, and Hart et al show an overlapping range of 8 to 15 micrometers. According to MPEP 2144.05 (1), a prima facie case of obviousness exists where the claimed ranges and

Art Unit: 3747

prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties.

Claims 10 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loughlin (5,661,904) in view of Hart et al (6,557,457) as applied to claims 1, 2, 4-8, 11-13, 15, and 16 above, and further in view of Fangman (3,479,929). Loughlin in view of Hart et al show everything except employing a tapering connecting rod and bore housing. Fangman teaches that it is old in the art to provide a tapering connecting rod and bore housing. It would have been obvious to one having ordinary skill in the art to modify Loughlin in view of Hart by providing a tapering connecting rod and bore housing, **in order to reduce the mass of the rod, while maintaining surface area connection between piston and rod (see column 1, lines 19-25 of Fangman).**

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loughlin (5,661,904) in view of Hart et al (6,557,457) as applied to claims 1, 2, 4-8, 11-13, 15, and 16 above, and further in view of DeBiasse (4,984,544). Loughlin in view of Hart teach everything except providing side relief channels along the inner circumference of the pin bore. DeBiasse teaches that it is old in the art to provide side relief channels 68 along the inner circumference of the pin bore. It would have been obvious to one having ordinary skill in the art to modify Loughlin in view of Hart et al by providing side relief channels, **in order to accumulate lubricating oil to lubricate between the surfaces of the pin and bore.**

Claims 3, 9, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loughlin (5,661,904) in view of Hart et al (6,557,457) as applied to

claims 1, 2, 4-8, 11-13, 15, and 16 above, and further in view of Lindstrom (5,039,285). Loughlin in view of Hart et al show everything except an internal gallery between the first and second ends of the connecting rod to direct lubricant between said first and second ends. Lindstrom teaches that it is old in the art to provide an internal gallery 66 between first and second ends of the connecting rod 42 to direct lubricant between said first and second ends. It would have been obvious to one having ordinary skill in the art to modify Loughlin in view of Hart et al by employing an internal gallery in the connecting rod **to facilitate lubrication of the piston pin and crankshaft.**

Response to Arguments

Applicant's arguments filed 11/16/04 have been fully considered but they are not persuasive.

Applicant argues that Loughlin (5,661,904) does not disclose or suggest a bushingless pivot surface between the piston pin and connecting rod, and that Loughlin argues the importance of employing a bushing. The examiner found no evidence that Loughlin argues the importance of employing a bushing, nor is the utilization of a bushing even mentioned in the claims of Loughlin. Loughlin is merely following conventional practices of employing a bushing without regard to the possibility of doing without one. Applicant further argues that Loughlin does not disclose or suggest a piston pin having a profiled outer circumference that includes a phosphatized coating as required by independent claim 7, as amended, and that Loughlin neither discloses nor suggests the combination of a piston pin having a profiled outer circumference and a bushingless connecting rod having a first end, a second end and an internal gallery 7

Art Unit: 3747

fixed therebetween to direct lubricant between the first and second ends as required by independent claims 12 and 18. The only item that the examiner disagrees with here is that Loughlin does not show a piston pin having a profiled outer circumference.

Loughlin does show a piston pin having a profiled outer circumference. The rest of the features that applicant points out are not shown by Loughlin are shown by various secondary references and Loughlin has not been relied upon to show these features.

Applicant further argues that the Hart et al (6,557,457) reference does not disclose or suggest the use of a profiled piston pin having an outer circumference that is substantially circular in cross-section with a larger diameter at the distal ends than at the center portion for use in connection with a connecting rod including a phosphatized coating having a thickness between two and less than eight microns as required by claims 1 and 7, as amended. The examiner agrees with applicant that Hart et al does not show a piston pin with a larger diameter at the distal ends than at the center portion. However, Hart et al is not being relied upon to show this feature, as it is already shown by Loughlin (5,661,904). Hart et al is relied upon to show a phosphatized coating. The phosphatized coating of Hart et al has "a depth or thickness of **about** 8.0 to 15 micrometers" (emphasis added, see column 3, lines 9-12 of Hart et al). Hart et al does not argue the importance of a thickness between 8.0 to 15.0 micrometers, as suggested by applicant. As noted in the above rejection, according to MPEP 2144.05 (1), a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. The examiner maintains that even though applicant has

amended the claims by adjusting the range to 2 to less than 8 micrometers to avoid overlapping with the range suggested by Hart et al, that the depth or thickness of the coating could be adjusted to suit the application involved, such as, for instance utilizing a smaller coating with a smaller piston-engine or a larger coating with a larger piston-engine. Also, please note the citation of prior art in the first Office Action, which included the references of Uchara et al, which utilizes a thickness of phosphate coating of 2 to 8 micrometers (see abstract) and Kagohara et al, which utilizes a thickness of phosphate coating of 2 to 30 micrometers (see column 2, lines 50-60), as further evidence that this particular coating depth does not provide a patentable distinction over the prior art.

Applicant further argues that the Lindstrom (5,039,285) reference does not disclose or suggest a piston pin having a profiled outer circumference that includes a phosphatized coating bonded thereto for use in connection with a connecting rod employed within an internal combustion engine as required by claim 18, and does not disclose or suggest a bushingless pivot surface between the piston pin and connecting rod of an internal combustion engine. The examiner agrees with applicant that Lindstrom does not show a piston pin with a phosphatized coating and does not mention a bushingless pivot surface between the pin and the connecting rod. However, Lindstrom is not being relied upon to show these features.

Applicant further argues that there is no motivation provided in any of the references to combine their teachings. The examiner has bolded the motivation to

combine for each reference relied upon in the above rejection in order to draw Applicant's attention to them.

Applicant further argues that the Loughlin and Hart et al patents are diametrically opposed and would have to be reconstructed or rearranged to change their operations if they were to be combined. The examiner is puzzled by this line of reasoning. Loughlin does utilize a bushing for the piston pin, as is conventional in the art, but does not rely upon the piston pin for patentability, and does not, as noted above, even mention it in his claims. The Hart et al reference teaches the advantage of utilizing a phosphatized coating as a means of eliminating the bushing and notes the following:

The coating absorbs and traps lubricating oil and develops a stiff lubricant squeeze film between the mating running surfaces of the connecting rod and wrist pin to provide the necessary tribological properties, eliminating the need for a conventional Cu-based bushing.

The invention has the further advantage of minimizing or eliminating the concern over bushing wear from increased levels of abrasive contaminants. The steel pins and connecting rods along with the coating are resistant to wear from such contaminants.

By eliminating the bushing, a cost savings is also recognized in both the material and labor of installation along with a reduction in the weight of the piston assembly.

So, as applicant can readily see, there is ample motivation to combine references.

Applicant further argues that the coating range of between two and less than eight microns is in contrast to the teachings of Hart et al because this range results in less vibration, engine noise or premature wear. The examiner still finds this reasoning unconvincing, as it has been held that discovering an optimum value of a result effective

variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272,205 USPQ 215 (CCPA 1980).

Applicant further argues that the Lindstrom (5,039,285) reference teaches the use of three oil ports within a connecting rod, and that this bears no relation to the combination of a profiled piston pin and a bushingless connecting rod including a phosphatized coating. The examiner is uncertain as to the thrust of this argument, but will try to respond. The Lindstrom reference shows an engine having a piston with a piston pin and connecting rod and an internal gallery 66 between first and second ends of the connecting rod 42 to direct lubricant between said first and second ends. It would have been obvious to one having ordinary skill in the art to modify Loughlin in view of Hart et al by employing an internal gallery in the connecting rod **to facilitate lubrication of the piston pin and crankshaft**. Again, it must be noted that Lindstrom is not being relied upon to show the shape of the piston pin and the phosphatized coating which replaces the bushing in a conventional piston pin.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marguerite J. McMahon whose telephone number is 703-308-1956. The examiner can normally be reached on flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yuen Henry can be reached on 703-308-1946. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



MARGUERITE MCMAHON
PRIMARY EXAMINER